

Geochemistry  
Spring 2013

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**Description:** This course will provide a general overview of geochemical systems and their interactions among atmospheric, aqueous, and near surface environments. Complex subjects will be developed gradually beginning with the basics and building. The idea is to give you an understanding of the importance of chemistry in geological and environmental interactions. Problem solving skills are critical to your success in this course. It is important that you attend class, pay attention and keep up with studying. Homework problem sets will be used to practice problem solving and to apply concepts learned in lecture. We will spend one hour per week in the computer lab developing problem solving skills, creating Excel worksheets, running geochemical models and taking assessment. You will be expected to use a computer to solve problems.

**Required Texts and Information:**

- Eby, G.N. (2004) Principles of Environmental Geochemistry. Thomson Brooks/Cole ISBN 0-122-29061-5, 514 p. **Please bring to every class.**
- The Chemical Engineering Department at Auburn University has an excellent series of article to help their student achieve their full potential as creative and capable chemical engineers. I see no reason why the same is not applicable for Chemistry, and Environmental Geoscience majors at SRU. The URLs are listed on the class D2L site. Please note: The homework format article is important. The required homework format for this class is attached to the end of this document.
- Engineering Computation Pad, 3-Hole Punched, 8.5 x 11. In bookstore approx \$8/100 sheets
- Select articles given out in class or online.

**Grading:** There will be weekly homework problems, quizzes, three exams and a final examination. In addition, you will be assessed for your preparation for class, performance during class and professionalism during the course. Values are listed below;

- |                    |     |
|--------------------|-----|
| • Homework/Quizzes | 25% |
| • Exams (3)        | 35% |
| • Final exam       | 30% |
| • Class Part/Prep  | 10% |

I will deal with all academic misconduct directly and reserve the option of referral to the Office of Student Standards. Academic misconduct will result in a grade of zero for the assessment. In addition, failure of the course will be at my discretion. Class attendance, preparation, and participation are integral components to a student's success. However, they do not guarantee a passing grade. The University strongly encourages students to attend every class, to spend at least two hours in review and preparation for each one hour in class, and to fully participate in all aspects of the course.

*Members of the Slippery Rock University community have developed a set of expectations for student behavior. These expectations are contained in the Code of Conduct. The Code of Conduct outlines the rights and responsibilities of all students, and it provides a fair process to evaluate and respond to allegations of misconduct. All students should read and be familiar with the expectations set forth in the Code of Conduct.*

*The Code is published in the Green and White Student Handbook, and in brochures available in the Center for Student Leadership (B-105 University Union). The Coordinator of Student Standards implements the provisions of the Code of Conduct and is available to provide information and answer questions concerning the University disciplinary process.*

**Homework:** We will use the general format for homework specified by the Department of Chemical Engineering at Auburn University. I will go over this in class. Please follow these guidelines. Homework assignments are required to be completed on “Engineering Paper”. This is available in the SGA Bookstore. A format example is attached. Homework will be assigned on Wednesday and will be due the start of the next lecture period unless stated otherwise. I will collect the homework at the start of class, photocopy it and return the photocopy by the end of the class. Homework solutions will be posted during class on the due date. You should review the solutions and compare to your submitted answers. If there is an error in your work, you have the option of correcting it on the photocopy (using blue ink and additional pages if necessary using standard homework format) and returning it to me by Friday of the due week for additional credit. Late homework will not be accepted.

**Attendance:** Please attend each class and come prepared by reviewing the material that will be covered. If you must miss a class, please send me an email (see below) as soon as possible. In your email please clearly indicate your name and date of missed class. You are responsible for all subject material covered in the book and all lectures and labs. Active participation in the class is to your benefit. We will begin each class with a short review/question & answer session. During this time you may ask questions to clarify material recently covered. In addition, I will ask randomly selected individuals questions related to the material about to be covered. I expect you to have read all material associated with the lecture of the day. Your performance will be assessed and used for the Preparation & Performance component in the grading section. Feel free to ask questions and contribute ideas or examples to the class. I will appreciate your attention during class. **If you encounter problems in the course, come and see me as soon as possible!**

**Course Management:**

I will be using SRU’s Desire2Learn (D2L) course management system (<http://d2l.sru.edu>). If you need help with D2L, please see the student support information at: [http://d2l.sru.edu/d2l\\_student\\_resources.html](http://d2l.sru.edu/d2l_student_resources.html).

**Professional email address and format:**

You are required to have an email address other than your [XXX#####@sru.edu](mailto:XXX#####@sru.edu) address. The name should be professional. I would suggest First name.Last name.SRU@XXXXX, e.g., [michael.stapleton.sru@gmail.com](mailto:michael.stapleton.sru@gmail.com). I would strongly suggest the use of Google’s product, gmail. I would also suggest this address be used only for academic and professional communications. This will significantly cut down on garbage in your inbox. Email communication in reference to this class must, at a minimum, include the following elements; Subject line that includes *EGeo 451 – Topic if applicable*, Salutation and Signature.

## Tentative Schedule

Date	Day	Class #	Topic
28-Jan-13	Monday	1	Class Starts
28-Jan-13	Monday	C1	Excel assessment
30-Jan-13	Wednesday	2	Chapter 2
4-Feb-13	Monday	3	Chapter 2
4-Feb-13	Monday	C2	Chem Assessment
6-Feb-13	Wednesday	4	Chapter 2
11-Feb-13	Monday	5	Chapter 2
11-Feb-13	Monday	C3	Computer
13-Feb-13	Wednesday	6	Chapter 2
18-Feb-13	Monday	7	Chapter 3
18-Feb-13	Monday	C4	Chapter 2 Assessment
20-Feb-13	Wednesday	8	Chapter 3
25-Feb-13	Monday	9	Chapter 3
25-Feb-13	Monday	C5	Computer
27-Feb-13	Wednesday	10	Chapter 3
4-Mar-13	Monday	11	Chapter 3
4-Mar-13	Monday	C6	Computer
6-Mar-13	Wednesday	12	Chapter 3
11-Mar-13	Monday	13	Chapter 3
11-Mar-13	Monday	C7	Computer
13-Mar-13	Wednesday	14	Chapter 3 Assessment
18-Mar-13	Monday		No Class
20-Mar-13	Wednesday		No Class
25-Mar-13	Monday	15	Chapter 4
25-Mar-13	Monday	C8	Computer
27-Mar-13	Wednesday	16	Chapter 4
1-Apr-13	Monday	17	Chapter 4
1-Apr-13	Monday	C9	Computer
3-Apr-13	Wednesday	18	Chapter 4
8-Apr-13	Monday	19	Chapter 4
8-Apr-13	Monday	C10	Computer
10-Apr-13	Wednesday	20	Chapter 4
15-Apr-13	Monday	21	Chapter 7
15-Apr-13	Monday	C11	Chapter 4 Assessment
17-Apr-13	Wednesday	22	Chapter 7
22-Apr-13	Monday	23	Chapter 7
22-Apr-13	Monday	C12	Computer
24-Apr-13	Wednesday	24	Chapter 7
29-Apr-13	Monday	25	Chapter 9
29-Apr-13	Monday	C13	Computer
1-May-13	Wednesday	26	Chapter 9
6-May-13	Monday	27	Chapter 9
6-May-13	Monday	C14	Computer
8-May-13	Wednesday	28	Chapter 9
15-May-13	Wednesday	Final Exam 10:30am-12:30pm	
		Final Exam 6:00pm-8:00pm	

## Student Learning Outcomes:

I have the following Student Expectations:

- Be serious about your university education
- Be willing to build on (review if necessary) material covered in previous university classes and in the Academic Standards for Pennsylvania (high school standards).
- Attend all class (on time) prepared by having read the material that will be discussed
- Actively participate in class
- Review all class material and notes as soon as possible after each class (but before next class) SRU expects you to spend two hours in preparation and study for each hour in class, I consider this a minimum
- Complete all assignment on time
- Take all quizzes and exams at the set time
- Ask question at any time, there are no stupid questions
- See me for assistance outside of class
- Respect your fellow students
- Adhere to the SRU Code of Conduct

Following Student Expectations as described above and showing an interest in your academic education, the student will:

- Obtain a broad understanding of the chemical principles controlling environmental processes and their effect on man and the environment.
- Be able to recognize and apply the methods of scientific problem-solving and critical thinking.
- Be able to solve geochemical problems using Excel and general geochemical software (PHREEQC, MINTEQ, ....ect.)
- Be able to summarize geochemical cycles of major elements.
- Solve quantitative problems of important geochemical and environmental consequence.
- Develop the ability to access, read, and understand information on geochemistry and improve upon reading and written communication skills.
- Be able to provide the scientific explanation behind general geochemical ideas to peers and improve upon verbal communication skills.

SRU's University-Wide Outcomes for Student Learning and Development

- **Communication** - Communicate effectively in speech and in writing, using appropriate information sources, presentation formats, and technologies.
- **Critical Thinking and Problem Solving** – Locate, analyze, synthesize, and evaluate information and ideas from multiple perspectives – mathematical, scientific, and humanistic. Apply this information literacy to contemporary challenges.
- **Values and Ethics** -Demonstrate an understanding of how the values of personal integrity, cooperative action, and respect for diversity influence one's own behavior and the individual and group behavior of others.
- **Social Awareness and Civic Responsibility** - Use knowledge of evolving human institutions and of diverse cultural and historical perspectives to interact effectively in a variety of social and political contexts.
- **Global Interdependence** - Act with an understanding of the cultural, socio-economic, and biological interdependence of planetary life.
- **Professional Proficiency** - Apply knowledge and skills to meet professional competencies within a specific discipline.

**Figure 1: Homework Format – working pages**

